

## CLAIMS

1. A method of preventing circular call forwarding loops for a communications unit capable of operating in a first network and a second network within a loosely coupled network, and respectively having a first network number and a second network number, as well as a first network voice mail, the method comprising:

receiving a call directed to the first network number of the communications unit;

storing first identification data corresponding to the call upon determining that the communications unit is not operating in the first network;

forwarding the call to the second network number of the communications unit;

receiving another call having second identification data for the communications unit subsequent to the forwarding of a call to the second network number of the communications unit;

comparing the second identification data with the first identification data; and

forwarding the call to the first network voice mail of the communications unit when the comparing the second identification data with the first identification data indicates a call forwarding loop.

2. The method of claim 1 wherein the storing the first identification data comprises storing caller identification data for the call and the comparing comprises comparing other caller identification data for the another call with the caller identification data for the call and when a match is found indicating the call forwarding loop, forwarding the call to the first network voice mail of the communications unit.

3. The method of claim 1 further comprises adding loop indicia to caller identification data and wherein the storing the first identification data comprises storing, in the call, the loop indicia combined with the caller identification data for the call and the comparing comprises checking for other loop indicia corresponding to the another call and comparing the other loop indicia corresponding to the another call with the loop indicia for the call and when a match is found indicating the call forwarding loop, forwarding the call to the first network voice mail of the communications unit.

4. The method of claim 3 wherein the loop indicia comprises one of a prefix and a suffix for the caller identification data, the prefix and suffix having a predetermined number sequence.

5. The method of claim 1 wherein the storing the first identification data comprises storing a tracked number of call appearances at the communications unit; the comparing comprises incrementing the tracked number of call appearances and determining when a predetermined limit for call appearances is satisfied; and when the predetermined limit is satisfied indicating the call forwarding loop, forwarding the call to the first network voice mail of the communications unit.

6. A network switch, comprising:

a switching mechanism for switching voice and data traffic and for connecting an enterprise network to a cellular network through a publicly switched telephone network; and

a controller in communications with the switching mechanism for setting up calls, the controller including a processor and a controller memory that is programmed to enable the processor:

to forward an enterprise call, which is directed to a communications device enterprise number, to a corresponding communications device cellular number in the cellular network; and

to associate calls with a call forwarding number either prior to, concurrent with, or subsequent to forwarding the enterprise call to the corresponding communications device cellular number of a communications unit when the communications unit is not operating in the enterprise network.

7. The network switch of claim 6 wherein the call forwarding number comprises an enterprise network voice mail number, whereby calls forwarded from the cellular network are directed to the network voice mail for a communication unit.

8. The network switch of claim 6 wherein the enterprise network comprises a wireless local area network (WLAN) and the switching mechanism and the controller respectively comprise a private branch exchange (PBX) gateway and a PBX controller.

9. The network switch of claim 6, wherein the associating calls with a call forwarding number comprises associating calls with a call forwarding number by instructing the communications unit to manipulate forwarding information in the second network to associate failed calls with the call forwarding number when the communications unit enters the second network.

10. A network switch, comprising:

a switching mechanism for switching voice and data traffic and for connecting an enterprise network to a cellular network through a publicly switched telephone network;

a controller in communication with the switching mechanism for setting up calls for the switching mechanism, the controller including a processor and a controller memory that is programmed to enable the processor:

to forward an enterprise call, which is directed to a communications unit enterprise number, to a corresponding communications unit cellular number in the cellular network;

to initially store first identification data corresponding to the enterprise call,

to compare second identification data corresponding to a subsequent call received by the switching mechanism from the cellular network with the first identification data, and

to forward the subsequent call to an enterprise network voice mail when the second identification data compared to the first identification data indicates a call forwarding loop.

11. The network switch of claim 10 wherein the processor to store the first identification data further is enabled to store caller identification data for the enterprise call and to compare comprises comparing other caller identification data for the subsequent call with the caller identification data for the enterprise call and when a match is found indicating the call forwarding loop, forwarding the call to the enterprise network voice mail of a communications unit.

12. The network switch of claim 10 wherein the processor further adds loop indicia to caller identification data and operates to store, in the enterprise call, the loop indicia combined with the caller identification data for the enterprise call and to compare comprises checking for other loop indicia corresponding to the subsequent call and comparing the other loop indicia corresponding to the subsequent call with the loop indicia for the enterprise call and when a match is found indicating the call forwarding loop, forwarding the call to the enterprise network voice mail of a communications unit.

13. The network switch of claim 12 wherein the loop indicia comprises one of a prefix and a suffix for the caller identification data, the prefix and suffix having a predetermined number sequence.

14. The network switch of claim 10 wherein to store the first identification data comprises to store a tracked number of call appearances at a communications unit; to compare comprises incrementing the tracked number of call appearances and determining when a predetermined limit for call appearances is satisfied; and when the predetermined limit is satisfied indicating the call forwarding loop, forwarding the call to the first network voice mail of the communications unit.



15. A method of preventing circular call forwarding loops for a communications unit capable of operating in a first network and a second network within a loosely coupled network, and having a first network number with the first network, a second network number with the second network, and a first network voice mail, the method comprising:

receiving a call for the communications unit on the first network number and upon determining that the communications unit is not operating in the first network;

detecting that at least one of an Original Called Number and a Redirecting Number is present in the call; and

forwarding the call to the first network voice mail if the at least one of the Original Called Number and the Redirecting Number is equal to the second network number.

16. A method of preventing circular call forwarding loops for a communications unit capable of operating in a first network and a second network within a loosely coupled network, and having a first network number with the first network, a second network number with the second network, and a first network voice mail, the method comprising:

in the first network, associating calls to the communications unit with a call forwarding number for the second network number of the communications unit.

17. The method of claim 16, wherein the associating calls to the communications unit with a call forwarding number for the second network number of the communications unit comprises providing the call forwarding number to the communications unit while the communications unit is operating in the first network.

18. The method of claim 16, wherein the associating calls to the communications unit with a call forwarding number for the second network number of the communications unit comprises directly manipulating forwarding number information, by the first network, in the second network via an interface between the first network and the second network.

19. The method of claim 16, wherein the forwarding number for the second network number of the communications unit comprises one of a number of the first network voice mail, the first network number, and a marker number, the marker number routed to the first network.

20. The method of claim 16, the method further comprising:
- receiving in the first network, subsequent to the associating calls to the communications unit with a call forwarding number for the second network number of the communications unit, a call to the communications unit;
  - detecting that a predetermined call forwarding loop condition exists for the call; and
  - forwarding the call to the first network voice mail when the predetermined call forwarding loop condition exists.
21. The method of claim 16, wherein
- the communications unit has a third network number with the first network and the forwarding number for the second network number of the communications unit comprises the third network number,
  - the method further comprising:
    - receiving in the first network, subsequent to the associating calls to the communications unit, a call directed to the third network number; and
    - forwarding the call to the first network voice mail when the communications unit is not operating in the first network, and
    - forwarding the call to the communications unit when the communications unit is operating in the first network.

22. A communications unit having a first network number with a first network and a second network number with a second network, the communications unit configured for:

receiving, while operating in the first network, a forwarding number from the first network; and

manipulating, while the communications unit is operating in the second network, forwarding information in the second network to cause the second network to use the forwarding number for the communications unit.

23. The communications unit of claim 22, wherein:

the forwarding number is a conditional forwarding number; and

the manipulating forwarding information in the second network comprises setting conditional forwarding information for the second network number to the conditional forwarding number after initiation of operation in the second network.

24. The communications unit of claim 22, wherein:

the forwarding number is an unconditional forwarding number; and

the manipulating forwarding information in the second network comprises:  
setting unconditional forwarding information for the second network number to the unconditional forwarding number prior to termination of operation in the second network; and

clearing the unconditional forwarding information for the second network number after initiation of operation in the second network.